IN THE UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

In re PARMALAT SECURITIES LITIGATION This document relates to: 04 Civ. 0030 (LAK)	Master Docket 04-MD-1653 (LAK) ECF Case

EXPERT REPORT AND DECLARATION OF

SCOTT D. HAKALA, PH.D, CFA REGARDING MARKET EFFICIENCY

I. Background and Qualifications of the Expert

1. I am a director of CBIZ Valuation Group, LLC, a national business valuation and consulting firm that operates as a wholly owned subsidiary of CBIZ, Inc., a publicly traded business services firm (NYSE: CBZ). CBIZ Valuation Group is one of the largest business valuation and consulting firms in the United States with offices in Dallas, Chicago, Atlanta, Milwaukee, St. Louis and Princeton (New Jersey). CBIZ Valuation Group employs approximately 100 individuals providing business valuation services to public and private companies.

2. I received a Doctor of Philosophy degree in Economics (with specializations in Monetary Theory and Finance and International Finance) and a Bachelor's degree in Economics from the University of Minnesota, I have earned the professional designation of Chartered Financial Analyst, awarded by the Association for Investment Management and Research. I have taught courses on asset pricing and market efficiency at the

doctorate (Ph.D.) level in a Ph.D. granting institution. In addition, I have served as a consultant and expert witness on numerous occasions regarding economic issues similar to those in this litigation. Examples of cases where my testimony regarding market efficiency was considered by courts at the class certification stage include *In re Broadcom Securities Litigation* (Central District of California; October 2003) and *In re Xcelera.com Securities Litigation* (District of Massachusetts, opinion September 2004; US First Circuit Court of Appeals, opinion December 13, 2005). A detailed summary of my qualifications, including prior testimony and articles, is provided on the *curriculum vitae* attached hereto as Exhibit A.

3. Plaintiffs are being charged fees for my services in this engagement based on my hourly billing rate of $500 per hour. I have received assistance from other staff employed by CBIZ Valuation Group.

II. Information Considered

4. My opinions are based on my professional experience, as well as a thorough review of a substantial amount of available materials, including:

(a) The Third Amended Consolidated Class Action Complaint ("Complaint") in this matter.

(b) The various briefs filed by the Defendants in this matter in opposition to class certification, including the supporting declarations and exhibits, particularly the Declaration of Paul A. Gompers ("Gompers Declaration"); the information produced electronically showing the data and analyses he relied upon in forming

his opinions, and the Declaration of Robert Comment, Ph.D. ("Comment Declaration").

(c) The Annual Reports of Parmalat Finanziaria S.p.A. ("Parmalat") with the Italian Regulatory Authorities (CONSOB) for the years 1998 through 2002, the Report on Operations and Financial Statements for 2004, and the Offering Memoranda or Circulars relating to the offerings of the various publicly traded securities of Parmalat identified in this report.

(d) Published news articles and press releases and other public news regarding Parmalat and its subsidiaries and affiliates from January 1998 through March 2004 found on *Factiva*, *LexisNexis* and *Bloomberg, L.P.*

(e) Various analysts' reports published between January 1999 and December 2003 as found on *Thomson Research* and produced in discovery.

(f) Institutional trade data from March 31, 2002, through June 30, 2005, provided by *Vickers*.

(g) The Chiaruttini Report, *1st: False Representations In the Balance Sheets Of Parmalat Group* and associated presentation summarizing the findings of this report and deposition testimony of Ms. Chiaruttini regarding this report, including originally presented and restated financial statements for Parmalat from 1999 through 2003.

(h) Publicly available financial information and public trading price information on Parmalat, market indices and similar public companies as found on *Bloomberg L.P.*

(i) Academic texts and published articles as cited in the footnotes and as follows:

i. *Capital Markets Institutions and Instruments* by Frank J. Fabozzi and Franco Modigliani – 1992

ii. *The Handbook of Fixed Income Securities*, Third Edition edited by Frank J. Fabozzi with the assistance of T. Dessa Fabozzi and Irving M. Pollack – 1991

iii. European Central Bank Working Paper Series Working Paper #164 – *Euro Area Corporate Debt Securities Market: First Empirical Evidence* by – Gabe de Bondt - August 2002

iv. *European Fixed Income Markets: Money, Bond and Interest Rate Derivatives* by Batten, Fetherson and Szilagyi - 2004

v. *Recent Developments in the Corporate Bond Market* – Deutsche Bundesbank Monthly Report – April 2004

vi. *The European Bond Markets under EMU* by Marco Pagano, Ernst-Ludwig von Thadden – November 2004

vii. *The International Role of the Euro: Evidence from Bonds Issued By Non-Euro Area Residents*, Occasional Paper Series No. 18, European Central Bank by Geis, Mehl and Wredenborg- July 2004

viii. *The Euro Bond Market Study*, by the European Central Bank - December 2004

ix. *European Bond Pricing Sources and Services: Implications for Price Transparency in the European Bond Market*, European Primary Dealers Associations - April 2005

x. *Response from the EFFAS – European Bond Commission to the Call for Evidence from the European Commission regarding Pre- and post-trade transparency provisions of the Markets in Financial Instruments Directive* (MiFID)– September 15, 2006

xi. *Building a Transatlantic Securities Market*, International Securities Market Association, by Benn Steil - 2002

xii. *Report on Foreign Portfolio Holdings of US Securities as of June 30, 2003* (US Treasury Report)- August 2004 Report

xiii. *Report on U.S. Portfolio Holdings of Foreign Securities as of December 31, 2003 (US Treasury Report)* - March 2005 report

xiv. *Global Financial Stability Report: Market Developments and Issues* by International Monetary Fund, September 2002, September 2003 and September 2004 issues, primary focus on Global Financial Market Developments – Chapter II and Statistical Appendices

xv. *European Corporate Bond Markets: Transparency, Liquidity, Efficiency* by Centre for Economic Policy Research authors Biais, Declerck, Dow, Portes and von Thadden, May 2006 (the "Biais Study"); Slide Presentation of the Biais Study Findings on June 22, 2006, for a seminar sponsored by ABI, EHYA, EPDA, ICMA, IMA & LIBA; related paper "Liquidity & Price Discovery in the European Corporate Bond Market," May 2005, by Biais and Declerck

xvi. *MiFID: FSA Discussion Paper on Best Execution Response from BMA/CMA/ISDA* - July 14, 2006

xvii. *Review of International Economics*, 12(4), 693-705, Patterns of Corporate Financing and Financial Systems Convergence in Europe by Victor Murinde, Juda Agung, and Andy Mullineux - 2004

xviii. *Implications for Liquidity from Innovation and Transparency in the European Corporate Bond Market,* European Central Bank Occasional Paper Series No. 50 - August 2006

xix. *Borsa Italiana Exchange Guide*

III. Summary of the Analyses and Conclusions

5. I was asked by counsel for the Plaintiffs to analyze the issue of market efficiency with respect to the trading of Parmalat securities, both common shares and fixed income securities (preferred and debt securities or bonds) during the proposed Class Period from January 5, 1999, through December 18, 2003 (the "Class Period"). I was also asked to evaluate Parmalat's solvency and ability to issue debt securities during the Class Period. Additionally, I was asked to review the expert declarations of Professor Gompers and Dr. Comment and address their opinions. Finally, in light of the analyses I performed, I also analyzed the timing of corrective information during the Class Period.

6. The premise for my market efficiency analysis is based on addressing the Informational Efficiency and Relative Efficiency of Parmalat's securities. Informational Efficiency exists when the market price of a security reasonably reflects all public information within a reasonable period of time.[1] Relative Efficiency means that investors

[1] A definition of Informational Efficiency consistent with this concept is set forth in *In re Xcelera.com Sec. Lit.*, 430 F.3d 503 (1st Cir. 2005), December 13, 2005, also *In re Xcelera.com Sec. Litig.*, 2002 U.S. Dist.

are generally unable to exploit potential informational inefficiencies (arbitrage opportunities) due to the economic costs of trading (both in direct and indirect fees and commissions and the economic cost of the effort).

7. In analyzing the trading of Parmalat common shares, I found an extremely efficient market for such shares. The trading volumes, turnover and market value of Parmalat's common shares available for public trading (the "public float") were well beyond the threshold levels normally considered necessary for an Informationally Efficient market. There was extensive financial news and analyst coverage of Parmalat throughout the proposed Class Period. Parmalat was able to register shares and other securities (including convertible securities) pursuant to shelf registrations in Europe. US institutions were attracted to and consistently held Parmalat common shares during the proposed Class Period. Additionally, my event study and statistical analyses found that Parmalat's shares reacted rapidly to identifiable news events and incorporated such news into the share price within a day. As a result, there were no arbitrage opportunities for trading Parmalat's common shares.

8. Similarly, I found that the trading of Parmalat's publicly registered fixed income securities was Informationally and Relatively Efficient.

(a) Due to the developments in the European securities markets, including the adoption of a common currency as of January 1, 1999, and the development of European electronic trading systems and information platforms, the European, Euro-based fixed income securities markets became more Informationally Efficient than the equivalent US and London securities markets during the Class Period.

LEXIS 7400, 2002 WL 745835 (D. Mass. 2002).

(b) The total amount of outstanding preferred and debt securities and the total trading volume and turnover of Parmalat's preferred and debt securities was exceptional by international bond trading standards. Parmalat's larger issue sizes for debt securities of €150 to over €500 million would and did attract substantial institutional and retail buyer interest. Retail trading of fixed income securities, including Parmalat securities, is substantially greater in Italy than in the US.[2] As a result of these developments, a dealer market for Credit Default Swaps ("CDSs") (a benchmark measure of Parmalat's credit risk and derivative security) developed during the Class Period and became quoted actively beginning in May 2003.[3] The development of a CDS market during the Class Period is a strong indicator of market efficiency throughout the Class Period. Thus, Parmalat's bonds were frequently traded and exhibited greater trading frequencies and greater notional volumes and turnover than equivalent US fixed income securities. This frequent trading and high notional volume of trading (average of at least €300 million per month in trading volume between January 2000 and October 2003, as summarized in Exhibit G for certain identified fixed income securities) led to active dealer and institutional investor interest in Parmalat fixed income securities being evident throughout the Class Period.

(c) Parmalat was actively covered by credit rating agencies and credit analysts in Europe. Additionally, the extensive equity analysis of Parmalat was relevant to and relied upon in evaluating Parmalat's fixed income securities.

[2] Estimated to be as much as 20% of the value of fixed income securities issued by Italian companies (Biais Study, p. 32).

[3] Based on *Bloomberg* L.P. reported bid and ask quotes for a benchmark Parmalat five-year credit instrument. *AFX European News* reports and others reports indicate quoted spreads in 2002.

(d) My event study and statistical analyses found that Parmalat's publicly registered fixed income security prices reacted to public information within a period of a day[4] and exhibited no systematic or exploitable arbitrage opportunities. Given the greater certainty in pricing fixed income securities and the substantially lower volatility of fundamental prices for fixed income securities, relative to common equity, investors in Parmalat's fixed income securities could reasonably and did generally rely on the quoted prices as reasonably reflecting the public information regarding Parmalat throughout the Class Period.

9. As part of my event study analyses, I was able to identify the timing of corrective information into the market and the effects of such information on the valuation of Parmalat's securities. Graphically, the timing of investor losses can be seen in Exhibit B-2 for Parmalat's common shares and Exhibits C-2 and D-2 for two of Parmalat's bonds. Three specific relevant events regarding investor's concerns about Parmalat's elevated debt levels and finances were identified between November 14 and December 5, 2002 (events 198, 199 and 201 in Exhibits B-1 and H). Similarly, the market reacted quickly to corrective concerns and news between February 10 and March 7, 2003 and to efforts by Parmalat to reassure investors on March 18, 21, 26 and 28, 2003. These events demonstrate that some leakage and loss causation (at least temporarily) occurred beginning November 14, 2002, and continued through March 7, 2003. Finally,

[4] The time period required for Relative Efficiency is subject to debate. In *Greenberg v. Crossroads Systems, Inc.*, 364 F.3d 657 (5th Cir. 2004) the District Court and Appeals Court both considered a two-day window sufficient for market efficiency. Academic studies have considered one-day, two-day and five-day event windows. Other cases, such as *In re Executive Telecard, Ltd. Sec. Litig.*, 979 F. Supp. 1021 (S.D.N.Y. 1997), have considered effects for up to ten days. Due to data limitations and continuing commentary and leakage, a two-day window is often used to allow for the influence of analyst and news reports and investor reactions that can continue to influence the share price on the day following the material event. From an *a priori* perspective, an Informationally and Relatively Efficient market should not allow for returns to be sufficiently correlated over time such that the ordinary investor could predict the likely movement of the share price and profitably exploit such information from one day to the next.

Parmalat's shares reacted swiftly to each partially corrective event between November 7 and December 19, 2003. In November 2003, the declines in Parmalat's securities prices were more modest. As can be seen in Exhibits B-3 for Parmalat's common shares and Exhibit E for Parmalat's fixed income securities, the leakage of corrective information began to negatively affect Parmalat's securities prices on November 7 and as additional information was disclosed regarding accounting problems on November 11 and 12, 2003. Additional news regarding Parmalat's financial condition (some positive and some negative) continued to influence Parmalat's securities prices throughout the remainder of November. On December 8, 2003, trading in Parmalat's common shares was suspended on the Milan Borse as a result of news of Parmalat's default and financial problems. The prices of Parmalat's securities all reacted swiftly and dramatically to this news. Parmalat's securities prices continued to be buffeted by news each day from December 12, 2003, onward, with some positive news but mostly negative news. The prices of Parmalat's securities then collapsed on December 19, 2003, when it was disclosed that Bank of America informed Parmalat that it did not have the €4 billion of liquid assets previously reported in Parmalat's financial statements. By the end of December 19, 2003, the prices of Parmalat's fixed income and equity securities had collapsed, with the typical senior unsecured bond prices in the 19.0 to 19.5 range and the common shares priced (after the weekend) on December 22, 2003, at $0.11. This rapid movement and convergence of prices in response to news strongly suggests an Informationally Efficient market for Parmalat's equity, preferred and debt securities through the end of trading on December 19, 2003. It also suggests that the full extent of the corrective information was not known or knowable by the investing public until December 19, 2003.

10. Given the financial restatements prepared by PriceWaterhouseCoopers and the Chiaruttini Report findings, presentations and associated testimony, it is obvious that at all times during the Class Period, Parmalat had a negative net worth and insufficient operating income to service its liabilities as they came due (absent raising additional fraud-based funds). In my experience, no fixed income obligations could have been issued during the Class Period without furthering Parmalat's insolvency. Since a solvency analysis is essential for any registered debt or preferred security offering, no offering of securities increasing the obligations of Parmalat could reasonably have been made and no investment bank or bank would have approved of such an offering. Similarly, entities alleged to have unreliable financial statements would not be able to raise funds via private offerings. Thus, all issuances of unsecured offerings of fixed income securities during the Class Period would not have been possible and could not have occurred had Parmalat's true financial condition been known or disclosed.

11. With respect to the Gompers Declaration, I found that, when properly considered, much of his analysis actually supported a Relatively Efficient market for Parmalat securities. The trading volumes and frequency of trading reported in the limited data considered by Professor Gompers is consistent with an active and developed market. Additionally, the data in Professor Gompers' Appendices actually show that the quoted prices and the average reported trade prices were generally consistent with each other. Additionally, the price charts show that both the quoted prices and the reported trade prices reacted quickly to information in November and December 2003. Professor Gompers' opinions with respect to Parmalat's fixed income securities reflect, in part, his failure to address the known issues with such data and failure to consider the issues of

Informational and Relative Efficiency in a proper context. His findings are, therefore, unremarkable and consistent with a Relatively Efficient global market for Parmalat's publicly traded equity, preferred and debt securities. Similarly, Professor Gompers' opinions with respect to the trading of Parmalat's common shares are consistent with what one would expect in an efficient global market for Parmalat's common shares.

12. With respect to the Comment Declaration, Dr. Comment overstates the barriers to US residents to trading European securities and understates the holdings of foreign securities by persons in the United States. US citizens can purchase and sell foreign registered securities indirectly from US brokers through their foreign affiliates or by registering accounts with foreign brokerage firms (or banks in the case of Italian securities).[5] Even Professor Gompers notes the existence of a "grey market" in the US for Parmalat common shares. This grey market is the result of US retail purchases of Parmalat common shares being reported by US brokers in the NASD system and understates US retail volumes and holdings.

13. Dr. Comment assumed that reported and identified US institutional holdings represented all or nearly all of the US holdings of Parmalat securities. In fact, US data sources typically apply a "gross up" factor to such reported holdings to account for unreported holdings by US institutions and retail holders.[6] Given the hundreds of grey market trades reported and the identified institutional holdings found by Dr. Comment,

[5] *Building a Transatlantic Securities Market, International Securities Market Association*, 2002, by Benn Steil, pp. 28-29 and 45.

[6] *See Report on U.S. Portfolio Holdings of Foreign Securities as of December 31, 2003*, March 2005 report, pp. 21-22. Also, see *Report on Foreign Portfolio Holdings of US Securities as of June 30, 2003*, August 2004 Report. The "gross up" factor for non-governmental issues of foreign long-term debt was 1.1591 on average in 2001 and 1.12542 in 2003, implying that actual holdings are estimated to be 15.9% greater than reported at the end of 2001 and 12.5% greater than reported at the end of 2003. The similar gross up factors for foreign equity securities was 1.04679 in 2001 and 1.04596 in 2003. The foreign equity gross up factor is likely understated for Parmalat common shares due to the fact that ADR and ADS holdings are reported with greater reliability than non-ADS and non-ADR holdings.

we can conclude that there were hundreds of entities holding Parmalat securities in the US and thousands of investors globally.[7]

14. Finally, the concept of a conflict between debt holders and equity holders makes little sense in the context of the claims in this case. Both debt holders and equity investors in Parmalat securities suffered damages as a result of the same events and, thus, were damaged in this case. The relevant events affected the fixed income securities and Parmalat's common shares in the same manner and direction over time.

IV. Market Efficiency Opinions and Conclusions

15. Market efficiency, or more properly Informational Efficiency, is a relative concept in practice in the real world. Generally, a securities market is efficient if arbitrage opportunities (the ability to profitably exploit past information) are relatively limited or absent on an *a priori* basis.[8] My assumption is that for class certification purposes the market for a given security must be sufficiently Informationally Efficient that buyers and sellers can assume that the price of a given security reasonably reflects the information publicly known or disclosed.[9] Consistent with this framework and in

[7] *Report on U.S. Portfolio Holdings of Foreign Securities as of December 31, 2003*, March 2005 report, shows that US investors held approximately $7.3 billion in long-term and $3.0 billion in short-term debt securities issued by Italian private issuers. Additionally, U.S. entities held an estimated $38.97 billion in equity of Italian entities, the tenth largest country in terms of US holdings of foreign equity securities and 6% of the Italian market capitalization.

[8] Arbitrage is the ability to earn excess profits or returns from information after accounting for the natural expenses of trading and the economic cost of the effort. The *a priori* basis is important. Sometimes, when mining the data, one might find apparent price patterns in retrospect that would not have been known or foreseeable prospectively. Thus, there is a hindsight bias that will be discussed later in this declaration that must be controlled for in the analysis. *See* Campbell, Lo and MacKinlay, *The Econometrics of Financial Markets*, 1997, pp. 20-24.

[9] *See*, for example, Cornell and Rutten, "Market Efficiency, Crashes and Securities Litigation," SSRN Working Paper (http://ssrn.com/abstract=871106). Cornell and Rutten note acknowledgement in the academic literature that perfect market efficiency does not and can not exist, but emphasize that when investors generally act and are justified in acting as though markets are efficient in reflecting information then reliance is reasonably presumed. *See, also*, Campbell, Lo and MacKinlay, *The Econometrics of Financial Markets*, 1997, pp. 20-24, particularly at page 24, "[P]erfect efficiency is an unrealistic benchmark that is unlikely to hold in practice" and the discussion of the notion of "Relative Efficiency" being more appropriate in this context.

addressing the factors outlined in *Cammer v. Bloom*, 711 F. Supp. 1264 (D.N.J. 1989), I found strong indicia of market efficiency for the common shares and certain of the publicly traded fixed income securities of Parmalat.

The Common Shares of Parmalat Traded in an Efficient Market

16. I found strong evidence for the level of market efficiency required for class certification of the common shares of Parmalat. I found no evidence of an undeveloped or inefficient market with respect to the trading of the common shares of Parmalat.

(a) There was more than adequate average trading volume of 3.45 million shares traded per day between January 4, 1999, and October 31, 2003 with substantially greater volume in the last two months of 2003. The daily trading volume during this period represented on average 0.89% of the public float and 0.43% of the outstanding shares. This translates into a weekly turnover rate of 4.35% of the public float and 2.09% of the outstanding shares. The public float (shares held by non-affiliates and readily tradable) was in excess of 350 million shares throughout the Class Period and represented an average market value for the public float in excess of €1.0 billion and always in excess of €500 million. The total market capitalization of Parmalat's outstanding shares was on average greater than €2.2 billion between January 4, 1999, and October 31, 2003. Even as late as December 19, 2003, the market value of the public float remained in excess of €110 million. The market value of the public float and trading volume was more than sufficient to attract substantial investor interest and to ensure market efficiency. The trading fundamentals and reasonably high turnover of the public float led to substantial analyst coverage during the proposed Class Period. As a result, a significant

portion of Parmalat's shares was held by institutional investors throughout the Class Period.

(b) News regarding Parmalat, including news regarding the movements in Parmalat's share price, was regularly found throughout the Class Period. Hundreds of analyst reports by many different analyst firms were issued during the Class Period and provided regular and consistent coverage of Parmalat.

(c) The fact that Parmalat's shares were actively traded on the Milan Borse in Italy and in good standing prior to the corrective disclosures is, in combination with the public float previously noted, usually sufficient to conclude that the market for its shares was reasonably efficient. This was one of the larger exchanges in Europe and considered a significant part of the integrated European securities market. As a result, Parmalat's shares were widely followed within Italy and Europe and any pricing discrepancies would have been reflected in the share price at this time.

(d) Parmalat was eligible to file and did file shelf registration statements with the CONSOB in Italy during the proposed Class Period and was able to register securities in Europe prior to the corrective disclosures. Parmalat also issued regular press releases and information regarding its earnings, guidance and commercial developments and made this information available on its Web site.

(e) Finally, there is a "cause and effect relationship" between the relevant unexpected corporate events and financial releases and movements in the security price. This is shown in Exhibit B-1 for Parmalat's common shares and will be discussed further in the following sections. Parmalat's share price tended to move considerably more on days of identified company-specific news. These

movements were rapid and efficient. After controlling for identified news events, there was no systematic or exploitable pattern in the trading of Parmalat's common shares that would allow for foreseeable arbitrage profits from trading by retail or institutional shareholders.

Parmalat's Publicly Traded Fixed Income Securities Generally Traded in an Efficient Market

17. Similarly, I found that certain registered debt and preferred securities of Parmalat traded in an efficient market during the proposed Class Period and that the privately placed securities would ordinarily be priced efficiently based on Parmalat's credit rating, publicly quoted bond prices, quoted credit default swap ("CDS") spreads and a reference interest rate.

(a) Debt and preferred securities (fixed income securities) trade differently from equity securities due to their lower volatility and greater security. Bonds are typically traded less frequently but in larger nominal amounts. Additionally, most of the trading volume in debt and preferred securities (especially if not convertible) involves institutional investors and dealers (brokerage firms that actively make a market in fixed income securities).[10] Whereas common stock represents a residual claim on the income of a company (with the expected future income of the company being uncertain and subject to frequent changes), a bond typically represents a fixed claim to receive interest and principal payments. Unless the debtor defaults, the bondholder largely knows what to expect and can

[10] Europe had an active retail market for Parmalat securities, as is noted later, and retail trading was quite frequent. However, institutional trades, while fewer in numbers, are significantly larger and account for most of the reported trading volume.

more easily evaluate the bond's value in comparison with common shares.[11] For investment grade bonds, the cumulative default risk, while not immaterial, is easily defined and placed within a set of manageable parameters or estimates based on the credit rating of the issuer. As a result, most debt securities are quoted and traded with reference to benchmark securities based on their respective credit rating and duration.[12] As long as there are regularly quoted debt securities of the issuer with the issuer having at least $250 million to $500 million in nominal debt outstanding and being regularly rated by recognized credit ratings agencies, the pricing of the debt securities of the issuer will tend to fall within a relatively tight range.[13]

(b) In examining the market liquidity for fixed income securities, investors often look at the quoted and effective bid-ask spreads to determine the costs of trading and level of dealer interest. Quoted bid-ask spreads below 100 basis points are generally evidence of a reasonably liquid security market.[14] As shown in Exhibit I, the quoted spreads were consistently below 100 basis points for Parmalat's publicly traded fixed income securities. Additionally, the quoted spreads substantially overstate the effective spreads that would be realized in practice (as buyers would pay the lowest asking price offered, not the adjusted average asking

[11] *European Fixed Income Markets: Money, Bond and Interest Rate Derivatives* by Batten, Fetherson and Szilagyi, 2004, pp. 4.
[12] Ibid., p. 4; *Response from the EFFAS – European Bond Commission to the Call for Evidence from the European Commission regarding Pre- and post-trade transparency provisions of the Markets in Financial Instruments Directive (MiFID)*– September 15, 2006, pp. 17-18; *MiFID: FSA Discussion Paper on Best Execution Response from BMA/CMA/ISDA*, July 14, 2006, p. 25.
[13] Biais Study conclusions.
[14] Fabozzi, *The Handbook of Fixed Income Securities*, Third Edition, 1991, p. 286. This source indicates that, historically, quoted spreads of one-quarter to one-half percent are considered "excellent" while spreads of 2% or greater would indicate more limited liquidity. Also, trading volume is the key determinant of liquidity and dealer interest.

price, and sellers would similarly sell for the highest bid price offered, not the adjusted average bid price).[15] Once institutional investors are satisfied that the market for the securities of an issuer is well-developed, the issuer has consistent coverage by credit ratings agencies, and the issuer is investment grade rated, then the trading behavior of institutional buyers in the bond market manifests an assumption that the market is efficient. There is very little speculative trading in investment grade bonds precisely because bond price volatility is too low to be potentially exploited and the valuation of investment grade rated bonds is too certain to allow for arbitrage profits from trading at the institutional and retail level.

(c) Fixed income markets have rapidly developed and become increasingly efficient in both Europe and the United States over the past thirty years. As a result, the ability of smaller specialist firms to make markets in bonds for larger issuers and to profit from making a market in such bonds has largely diminished. For example, in the *Wechsler*[16] case set forth on my resume, Wechsler, a boutique specialist firm that focused on convertible debt issues and below investment grade rated debts of smaller issues offered by small or mid-capitalization companies, was successful in the 1980s, but rapidly lost its ability to compete and profitably trade as a dealer by the early to mid-1990s. The growth of electronic trading systems and computer programs that can monitor the quoted prices of fixed income securities substantially narrowed the profit margins and bid-ask spreads that were necessary for the smaller boutiques, such as Wechsler, to earn a

[15] Biais Study, pp. 57-58.
[16] *Wechsler & Co., Inc. v. Commissioner of Internal Revenue*, United States Tax Court (Docket No. 9667-04).

consistent profit from their specialist activities. Thus, for example, by the mid-1990s, Wechsler had substantially reduced its emphasis on specialist (dealer activities), increasingly traded in more speculative convertible issues and experienced more volatility returns (including losses). By the late 1990s, electronic trading systems had proliferated both in the United States and in Europe and were widely available to institutional investors.

(d) Beginning in 1998 and continuing through the current date, the evolution of the European market to a common currency, which became effective January 1, 1999, had profound effects on fixed income securities trading in Europe. The markets in Europe became increasingly integrated and issuers quickly moved from issuing securities in their own currencies and national markets to issuing securities available for purchase on a global basis within Europe in the late 1990s.[17] Additionally, European institutional investors began to actively diversify out of securities issued within their national currencies and within their national markets into Euro-based securities with increasingly less regard for the country of the issuer.[18] Global investors similarly began to increasingly diversify their holdings, increasing steadily their holdings and percentage holdings of Euro-based securities over time.[19]

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[17] *See*, for example, *European Fixed Income Markets: Money, Bond and Interest Rate Derivatives* by Batten, Fetherson and Szilagyi, 2004; *The Euro Bond Market Study* – December 2004; *Global Financial Stability Report: Market Developments and Issues* by International Monetary Fund, September 2002, September 2003 and September 2004 issues, primary focus on Global Financial Market Developments – Chapter II and Statistical Appendices and other quotes and references provided as an appendix to this report.

[18] See references in prior footnote.

[19] Ibid. *see also Report on U.S. Portfolio Holdings of Foreign Securities as of December 31, 2003*, March 2005 report.

(e) As a result of these developments, multi-national and regional investment banks, European banks, and brokerage houses began to compete aggressively to trade in European fixed income securities. This greater competition among dealers and the diversification trends meant that larger issuers of fixed income securities, such as Parmalat, and larger fixed income offerings above €250 million (or $250 million) experienced greater relative trading volumes and turnover, more frequently published quotations, and smaller bid-ask spreads in Euro-currency countries than experienced in the London and United States fixed income securities markets. As the pricing of Euro-based issues in European countries became more competitive in the 1990s in anticipation of the adoption of the Euro and increasing economic integration in Europe, European corporations rapidly shifted from relying primarily on banks as a source of debt financing to increasingly issuing debt and preferred securities that were available for purchase and sale by institutional and retail buyers. Also, there was a rapid shift to and increase in offerings of fixed income securities by both European and non-European corporations in the European markets and in Euros, away from the British and US securities markets and away from British Sterling and US Dollars.[20] Thus, the European market for Euro-based fixed income securities became increasingly global and quickly became more efficient than the fixed income securities market in the United States during the Class Period. This shift can be seen in the shift in Parmalat's debt offerings from Italian and local

[20] *See*, for example, *The International Role of the Euro: Evidence from Bonds Issued By Non-Euro Area Residents*, Occasional Paper Series No. 18, July 2004, European Central Bank by Geis, Mehl and Wredenborg; *see, also*, *The Euro Bond Market Study*, December 2004 by the, European Central Bank.

currency based offerings in 1996 and 1997 to increasingly Euro and Dollar-based offerings.

(f) Given the market developments discussed, I found no evidence of difficulties in finding dealers willing to buy and sell Parmalat bonds during the Class Period and plenty of indicia (in quoted bid-ask spreads and trading volumes) that Parmalat bonds were not difficult to trade. Most of the volume in Parmalat fixed income securities involved institutional investor and dealer trading. Securities trading dominated by institutional investors, dealers and buy-and-hold investors can be as or more efficient, by some academic criteria, than markets dominated by small retail "noise" traders. Indeed, the credit markets were remarkably efficient in managing the collapse of Parmalat and the triggering of default on its debt securities in December 2003.[21] Additionally, the features of the Italian bond market (some vestiges of practices prior to 1999) are such that retail investors tend to be more active and hold a larger portion of bonds issued by Italian companies. One can purchase Italian bonds through Italian banks such that a significant portion of Italian bonds are purchased by retail investors.[22] This meant that Italian banks often carried and held Parmalat securities and interacted actively with the dealer market. As a result of the active dealer and institutional market (including banks), the retail investors typically relied on the quoted prices consistent with an efficient market.

(g) Reported trading volumes for certain Parmalat fixed income securities are provided in Exhibit G. The trading volumes and turnover rates of the Parmalat

[21] *Global Financial Stability Report: Market Developments and Issues* by International Monetary Fund, September 2004, pp. 56-57.
[22] Estimates of 20% of holdings by retail customers but declining in percentages (Biais Study, p. 32).

fixed income securities as a group and for most of the fixed income securities identified in Exhibit G are exceptional for fixed income securities and provide strong evidence of active investor interest in Parmalat's fixed income (debt and preferred securities). Where International Capital Market Association ("ICMA") trade information was produced for the Parmalat debt securities, the total trading volume and turnover of Parmalat's debt securities was significant, representing identified monthly average volumes of approximately €300 million between January 2000 and October 2003 and a turnover rate of 7.4% per month over this time period. This is significant, despite the fact that the ICMA trade data excludes significant retail and bank trade volumes and the volumes of certain dealers that do not report to ICMA. Trading volumes rose dramatically with the relevant news events in November and December 2003, indicating a market that is extremely active and liquid at the end of the Class Period.[23] Additionally, as shown in Exhibits C-2 and D-2 and summarized in Exhibit I, the publicly registered fixed income securities issued by Parmalat were, in general, consistently quoted on *Bloomberg*, and the *Bloomberg* mid-price (the price halfway between the bid and ask quotes) represented an appropriate estimate of the market price given the observed trading information (after controlling for fees and commissions on reported trades).[24] Thus, given the trading volume and turnover information summarized in Exhibit G, the total trading volume in

[23] *Global Financial Stability Report: Market Developments and Issues* by International Monetary Fund, September 2004, pp. 56-57.
[24] *See also* Biais Study, pp. 29-30 ("These quotes are indicative but close to the prices at which trades can occur.") and *European Bond Pricing Sources and Services: Implications for Price Transparency in the European Bond Market* – April 2005, p. 2 and 7.

Parmalat debt securities was substantial and produced sufficient turnover to create a reasonably efficient market for trading in Parmalat debt securities.

(h) Parmalat's outstanding debt issues were so large in amount and constituted such large daily trading volume that Parmalat was consistently followed and rated by bond dealers and institutional investors. Parmalat was regularly covered by credible credit ratings agencies such that significant potential changes in Parmalat's credit rating were rapidly reported and affected Parmalat's debt securities prices rapidly, particularly in November and December 2003. Additionally, the extensive coverage of Parmalat by equity analysts provided substantial and regular information on Parmalat's prospects. Such equity coverage is important to fixed income investors in providing an indication of the risks of default and the prospects for adequate income to services Parmalat's fixed income securities.

(i) The analysis provided by Professor Gompers (Exhibit 3 to the Gompers Declaration) finds with relatively incomplete production (from a modest sample of dealers and ICMA and exchange data) that individual Parmalat bonds traded on approximately 55% of the potential trade days. His data understates the actual amount of trading by ignoring the significant retail trading and other institutional trading of Parmalat securities not reported in the ICMA data in Europe (particularly in Italy). Nevertheless, such frequency of trading is considered outstanding by bond market standards. In fact, many of the Parmalat bonds reported trading nearly every day when the Banca Intesa trade information is included in the analysis (such as XS0123321068 and XS0106583577). As shown

in Exhibit I, Parmalat's bonds were consistently quoted by dealers, evidencing a very active market for such securities. Thus, when retail data from Italian banks and clearing data is considered, Parmalat bonds were extremely actively traded by US standards. By comparison, bonds that are considered more illiquid tend to trade maybe once per week or once or twice per month. A Parmalat bond was reported as traded nearly every day during the Class Period and many of Parmalat's larger issues traded on most of the available trade days and often traded multiple times on a given day. Furthermore, the trading volume, not the number of trades, is more indicative of bond market liquidity.[25]

(j) Additionally, as shown in Exhibits C-1, D-1 and H, the trading in Parmalat debt securities responded relatively quickly and consistently over time to relevant information. Parmalat's debt securities traded within relatively tight trading ranges determined by a market bond index and market interest rates and Parmalat's fixed income securities prices reacted rapidly to news likely to materially affect Parmalat's credit rating but reacted very little otherwise. The event studies in Exhibits C-1, D-1 and H will be discussed further in the next section.

(k) Parmalat's choice to issue debt securities in private placements in US dollars during the Class Period, especially in 2003, was a function of the development of actively quoted Credit Default Swap ("CDS") spreads for a five-year benchmark Parmalat debt security. The CDS market for Parmalat developed during the Class Period and was regularly noted in articles in late 2002 and in 2003. With the CDS market, privately placed debt could be traded and priced efficiently in the latter

[25] Fabozzi, *The Handbook of Fixed Income Securities*, Third Edition, 1991, p. 286.

part of the Class Period. Additionally, the development of a CDS market during the Class Period allowed dealers to take positions in privately placed Parmalat securities while hedging their credit risks. This meant that dealers were more willing to take positions in Parmalat's privately placed securities and willing to provide quotes for such securities with tighter spreads. Thus, institutional investors became increasingly willing to purchase Parmalat's privately placed securities instead of limiting their interest to the publicly traded securities of Parmalat.[26] This information demonstrates that the market for Parmalat's privately placed debt securities became increasingly efficient throughout the Class Period.

V. Discussion of Event Studies on Parmalat Equity and Debt Securities

Equity Event Study

18. In order to assess the reaction of Parmalat's share price to relevant news events, I performed an event study. The event study is summarized in Exhibit B-1. An event study is based on a market model. A market model is a model of how the price of a security (in this case, the price of Parmalat's publicly traded securities) moves in relation to a market index and/or an index of peer group companies and responds to news and information.

19. An event study is composed of three stages. The first stage of my event study was the identification of material events. The intent of this step of the event study analysis was to control for all days when potentially material information specific to Parmalat

[26] *Building a Transatlantic Securities Market, International Securities Market Association*, 2002, by Benn Steil, pp. 587-59, notes the rapid rise in Rule 114A.

came into the market.[27] The available public information was reviewed to determine information that investors would find to be material to Parmalat shareholders on a qualitative basis.[28] This information included analysts' reports, press releases, securities filings,[29] and news articles (newspapers and daily publications, as well as more general publications).

20. The second stage of the event study involved the identification market indices and guideline or peer group companies appropriate for Parmalat and the analysis of the movements of the identified market indices and shares of the guideline companies relative to the movements of Parmalat's shares. As a preliminary matter, I considered two indices that were reasonably likely to explain market and industry elements of the movements in Parmalat's share price. These two indices were the Milan MIB Telematico Index ("MIBTEL") and the Dow Jones Europe STOXX Food and Beverage Index ("SX3P"). As seen in Exhibit B-1, both indices were jointly significant in explaining the movements in Parmalat's share price overall after controlling for potentially material events. The two indices were able to explain 16.62% of the overall variance on non-event days during the event study period (January 4, 1999 to December 19, 2003). The extremely significant relationship between Parmalat's share price and two relevant

[27] As long as there are sufficient degrees of freedom, the addition of more events (over-identification of events) will ensure a set of "clean" observations in the control sample of "non-event days" and avoid contaminating the market model estimates. Thus, adding "too many" events ensures the relative absence of bias and ensures consistency of the estimates but at some slight loss of efficiency. See, for example, Intriligator, *Econometric Models, Techniques, and Applications*, 1978, pp. 188-189, and Pindyck and Rubinfeld, *Econometric Models and Economic Forecasts*, 1991, p. 162-166.

[28] The list of material items relied upon is based on the NASDAQ guidelines as recognized by the SEC in *Federal Register*, Vol. 67, No. 157, August 7, 2002, pp. 51306-51310. I then added third party news reports, analysts' reports and insider trading events to that list consistent with the academic studies. The dates identified as having potentially material news events and, therefore, associated with indicator variables are listed in Exhibit B.

[29] Most securities filings are routine and/or duplicate previously disclosed news. Thus, only when a news article or analyst mentions something surprising or new in such filings are they customarily identified as possible events for the purposes of this study.

indices is considered strong evidence of market efficiency in that it indicates that industry and market changes are effectively and rapidly reflected in Parmalat's share price.

21. The third stage of the analysis involved analyzing the candidate events (identified in stage one) in an integrated event study regression. I used the integrated regression or event parameter approach.[30] This approach was selected because the older "two-pass"

[30] In creating a precise, reliable market model required for an event study, one should account for the effects of all significant company-specific news events during the study period, even news unrelated to the subject of interest. This is done using dummy or indicator variables integrated into the market model regression to capture and control for the effects of company-specific events. In a chapter of the textbook *Market Models: A Guide to Financial Data Analysis, 2001*, Alexander explains (p. 441), "Dummy variables should be viewed as necessary measures for data that have structural breaks, regime shifts or seasonalities. If dummies are omitted there will be residual problems that lead to inefficient parameter estimates on the real explanatory variables." In other words, if there are significant news events that caused the stock price of Parmalat to move on specific days (both related and unrelated to the allegations in this case), it is necessary that one capture the effects of such news events with dummy variables on the appropriate dates in order to have a reliable analysis. Alexander specifically states (p. 440), "[O]ne might consider creating a dummy variable to model the timing of important news announcements,… Structural break dummy variables are important whenever the data covers a permanent shift arising from a change in regime, or a temporary shift due to an extreme market movement. Dummy variables should be used prudently and only if there is a real reason, such as an important news announcement...." Consistent with this, I only included dummy variables in my event study for news events specifically related to Parmalat (that were identified *a priori* without reference to the actual price movements of Parmalat's shares) that were, in the context of this study, deemed important (material).

Many academic articles discuss the use of dummy/indicator variables to capture the effects of events including: Larcker, Gordon and Pinchea, "Testing for Market Efficiency: A Comparison of the Cumulative Average Residual Methodology and Intervention Analysis," *Journal of Financial and Quantitative Analysis*, June 1980, pp. 267-287; Box and Tiao, "Intervention Analysis with Applications to Economic and Environmental Problems," *Journal of the American Statistical Association*, March 1975, pp. 70-79; Binder, "Measuring the Effects of Regulation with Stock Price Data," *The RAND Journal of Economics*, Summer 1985, pp. 167-183; Karafiath, "Using Dummy Variables in the Event Methodology," *The Financial Review*, August 1988, pp. 351-358; Malatesta, "Measuring Abnormal Performance: The Event Parameter Approach Using Joint Generalized Least Squares," *Journal of Financial and Quantitative Analysis*, March 1986, pp. 27-38; Marais and Schipper, "Chapter 17A: Event Study Methods: Detecting and Measuring the Security Price Effects of Disclosures and Interventions," *Litigation Services Handbook: The Role of the Financial Expert*, Third Edition, 2005 Cumulative Supplement, pp. 17A-15 to 16, 18 and 22 to 23 (discusses the 'event parameter" method, the use of the method to accommodate multiple events and in managing more complex modeling issues); and Dufour, "Dummy Variables and Predictive Tests for Structural Change," *Economics Letters*, 6, 1980, pp. 241-247. (Marais has served as a consultant and co-expert in two securities cases in the past year in both testing and validating my methodology.) Examples in textbooks discussing using dummy indicator variables to capture events in time include: Pindyck & Rubinfeld, *Econometric Models & Economic Forecasts*, 1991, pp. 104-108; Spanos, *Statistical Foundations of Econometric Modeling*, 1986, pp. 536-539 (and as part of a continuing example of modeling money holding behavior in a dynamic, time-series regression); Enders, *Applied Econometric Time Series*, 1995, pp. 243-249 (discusses structural change in unit root time-series and uses dummy variables to test for and adjust for structural change or level shifts in such series); Intriligator, *Econometric Models, Techniques, and Applications*, 1978, pp. 58-61, and Campbell, Lo and Mackinlay, *The Econometrics of Financial Markets*, 1997, p. 167.

cumulative abnormal returns ("CAR") approach to event studies can often be a biased and inconsistent approach to analyzing events.[31] The integrated regression approach yields consistent and unbiased estimates of both the market model and the effects of

[31] The traditional CAR analysis fails to control for company-specific news and, thus, provides a misspecified test in that it consistently fails to control for the factor it seeks to test and, thus, improperly formulates the hypothesis test, especially in a single company event study analysis.

There is substantial general and specific literature in the statistics, economics and finance fields discussing the problems that can arise in the traditional two-pass CAR methodology. See, for example, Larcker, Gordon and Pinchea, "Testing for Market Efficiency: A Comparison of the Cumulative Average Residual Methodology and Intervention Analysis," *Journal of Financial and Quantitative Analysis*, June 1980, pp. 267-287. The authors in this paper state (p. 267), "The objective of this paper is to suggest that the traditional CAR methodology is often inappropriate and that *intervention analysis* [italics in original] is a possible alternative. Where the systematic risk *(i.e*. Beta) of a firm changes as the result (or in anticipation) of an announcement, the cumulative average residual methodology will result in biased residuals. …Intervention analysis, on the other hand, can separate such risk changes from the information content of the announcement. In addition, intervention analysis also allows the observed auto-correlation in the market model residuals to be removed, thus providing improved beta estimates required for reliable statistical testing." Franses in *Time Series Models for Business and Economic Forecasting*, 1998, recommends "intervention" analysis (p. 130) consistent with Box and Tiao (1975) and points out the statistical problems that arise when one does not capture the effects of known events (with dummy variables) or "neglects them" (pp. 128-129). He states (p. 144), "With *a priori* knowledge of specific events and approximate dates which may yield aberrant observations (…), it is not difficult to examine their relevance for a model that will be used for forecasting. We can simply extend our model with additional regressors, such as the dummy variables…. Standard tests for significance can then be used to decide which regressors are potentially important for forecasting." In other words, not only should a researcher use *a priori* information to identify possible events for inclusion in the regression analysis as dummy variables, but should then test to determine whether such dummy variables should be included in the final analysis.

The bias and inconsistency problems associated with the two-pass or CAR event analyses are particularly significant in single company event studies. First, the "clean period" required to obtain estimates of the standard errors and the coefficients of the market model in the CAR methodology is almost never really clean in a statistical sense. Clean in a statistical sense implies few or no significant company-specific events and a properly specified market model. Because company-specific events are common in stock price return data, the residuals during the candidate "clean period" are usually not normally distributed (fat tails or kurtosis is common) and the estimated market model is biased and inconsistent due to an *omitted variables problem*. These problems lead to overstated standard errors and understated t-statistics during the event analysis stage of the two-pass methodology. Additionally, fundamental changes in the businesses of a company and its peer companies over time can render the market model coefficients in the "clean period" inapplicable to or biased relevant to the estimation period. (*See*, for example, Marais and Schipper, "Chapter 17A: Event Study Methods: Detecting and Measuring the Security Price Effects of Disclosures and Interventions," *Litigation Services Handbook: The Role of the Financial Expert*, Third Edition, 2005 Cumulative Supplement, pp. 17A-16 to 21, wherein they discuss the problem of low "power" in single company event studies and the problem of "interventions" in the estimation period yielding "unstable results".) Second, the market model in the two-pass CAR methodology is often estimated using a daily returns series. The low percentage of variance explained by the market model (low R-squared of 15% or less) leads to an unfavorable (low) signal to noise ratio and will tend to cause the market model coefficients to be understated or inaccurate even if the omitted variables (omitted company-specific events) did not cause them to be biased. For this reason, beta estimates are preferably made using longer return windows until the R-squared improves or the estimation of the market model must be made in a regression with the company-specific events included as indicator or dummy variables. *See* Franses in *Time Series Models for Business and Economic Forecasting*, 1998, pp. 128-129.

events over the period of interest.[32] After identifying all candidate events, the measured effect of each candidate event is analyzed in the context of daily returns.

22. The measured effect of each potentially material event is provided in Exhibit B along with a measure of its statistical significance in the form of a t-statistic.[33] For individual events, statistical significance will be set based on a t-statistic of 1.65 in absolute terms (a 90% confidence level using a two-tailed test, 95% confidence using a one-tailed test).[34] Individual events that were not statistically significant should, nevertheless, remain in the regression results and affect the overall analysis because they are part of the entire event selection process.[35] Otherwise, the exclusion of such intervention variables may alter the statistical inferences. Events that have a t-statistic of greater than one in absolute terms are viewed as "meaningful" in that these events improve the overall "information" in the study and, all else being equal, were more probably than not, given the prior selection process, to have had some effect on the price of Parmalat's shares.

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[32] *See* references and discussions in the two prior footnotes.

[33] A t-statistic measures the difference between the estimate and zero based on the sample size and an approximately normal distribution underlying the process.

[34] Statistical significance has more than one meaning and is not a talismanic term. *See* David H. Kaye & David A. Freedman, Reference Guide on Statistics, in *Fed. Jud. Cntr., Reference Manual on Scientific Evidence* 83, 123-27 (2d ed. 2000) (discussing practical significance); Alan Stuart, et al., *Kendall's Advanced Theory of Statistics, Volume 2A: Classical Inference & The Linear Model* 193 (6th ed. 1999) ("This numerical convenience [rule of thumb criteria for statistical significance] has persisted long beyond its hour of need."); Lapin, *Statistics for Modern Business Decisions*, p. 186 (1978) ("A decision rule must be chosen that will provide a lower probability of the more serious error . . . . He [the decision-maker] should therefore be wary of setting Alpha [the criteria for significance] and Beta at arbitrary or traditional levels."); Berry and Lindgren, *Statistics: Theory and Methods*, pp. 423-27 (2d ed. 1996) (arguing against a fixed criteria for statistical significance and for considerations of practical significance); and Cassidy, *Using Econometrics*, pp. 129-138 (1981) (describes the setting of confidence levels at the 10% rejection rate and "One-sided tests should be used whenever the researcher's prior permit."). An event with a t-statistic of 2.33 or greater in absolute terms is often considered "highly significant" at the 99% level, and an event with a t-statistic greater than 3.0 is often considered "extremely significant" or an "outlier" that is so significant its existence is rare absent some actual event and inconsistent with random noise derived from the normal distribution given the number of degrees of freedom.

[35] Cassidy, *Using Econometrics*, pp. 252-253 (1981) discusses the problem with selectively deleting intervention variables that are insignificant from the analysis and discusses the use of collective (joint) tests for the inclusion of groups of intervention variables as a whole, rather than individual interventions.

23. Although the identified events (290 in total) accounted for only a fraction of the total trade days considered in the analysis (1257 observations), they jointly explained most of the variance in Parmalat's share price not already explained by market and industry indices throughout the study period. An F-test is a conservative test for the statistical significance of a group of events or explanatory variables. The F-test for significance of the identified events suggested a confidence level in excess of 99.99% for the identified events.[36] To limit the analysis and exclude the events in November and December 2003, I performed an F-test only on the events between January 4, 1999, and October 31, 2003. This test found that the events prior to the end of the Class Period were extremely significant.[37] Thus, the share price of Parmalat reacted more and was significantly more likely to change in relative terms on identified event days than on non-event days.

24. Additionally, I tested for an exploitable relationship between abnormal returns over time. When examining closing prices from electronic exchange data, there will be a tendency for an economically insignificant (but statistically significant) false negative correlation between abnormal returns from one day to the next day to arise. This is the result of the bid-ask spread and is discussed at greater length later in this declaration (in addressing the opinions of Professor Gompers).[38] Similarly, the presence of news events and outliers can lead to false and apparently significant serial correlation. However, tests

[36] F(290,965)= 40.29497 with Significance Level 0.00000000.
[37] F(263,958)= 3.38072 with Significance Level 0.00000000.
[38] *See*, for example, Campbell, Lo and MacKinlay, *The Econometrics of Financial Markets*, 1997, pp. 99-103, wherein they discuss the effect of the bid-ask spread on various econometric tests. They note at page 100, "Moreover, as random buys and sells arrive at the market, prices can bounce back and forth between the bid and ask prices, creating spurious volatility and serial correlations in returns, even if the economic value of the security is unchanged." This "bid-ask bounce" issue will be discussed in more detail later in this report in the context of my review of Professor Gompers' analysis and the conceptual and practical problems with his analysis of "lead-lag relationships."

for a correlation of abnormal returns on non-event days based on the abnormal returns experienced two days prior and three days prior, even with the extremely large sample size (967 observations) one cannot find any meaningful relationship and the F-test is nowhere close to significant. This means that arbitrage profits are not systematically available. For example, an abnormal return of 5.00% two days prior would only predict a -00.10% effect on the return on the current day and an abnormal return of 5.00% three days prior would only predict a +00.09% return on a given day. The fact that the sign changed between the two lag periods suggests no systematic or exploitable pattern in abnormal returns over time and the ability to predict future Parmalat share price movements based on past share price movement is substantially less than imputed trading costs in even the most efficient market. Thus, no exploitable arbitrage opportunities existed for trading in Parmalat common shares and the market for such shares was Relatively Efficient during the Class Period.

25. The events and their significance are summarized in Exhibit B-1. Not surprisingly, the events one might suspect as being important proved to be extremely significant. The reaction to three specific relevant events regarding investor's concerns about Parmalat's debt levels and finances between November 14 and December 5, 2002 (events 198, 199 and 201), each led to statistically significant (95% in the one-tail test; 90% in the two-tail test) declines in Parmalat's relative share price. Similarly, the market reacted quickly to corrective concerns and news between February 10 and March 7, 2003, and to efforts by Parmalat to reassure investors on March 18, 21, 26 and 28, 2003. These events demonstrate that some leakage and loss causation (at least temporarily) occurred beginning November 14, 2002, through March 7, 2003. Finally, Parmalat's shares

reacted swiftly and dramatically to the corrective news events between November 7 and December 19, 2003. Furthermore, the reactions to new material news tended to be swift and fully absorbed within one full day of trading in the absence of additional news and commentary. I found that until the news on December 19, 2003, the market was not informed of the actual breadth of the problems within Parmalat with the disclosure of the absence of funds in a Bank of America account claimed by Parmalat. At the close of trading on December 22, 2003, the price of Parmalat's shares had declined substantially and ceased trading efficiently.

26. The event study, while thorough, is preliminary. Therefore, I may amend and supplement my conclusions based on subsequent analyses.

Parmalat Fixed Income Securities Event Studies

27. I chose to evaluate the events for Parmalat bonds with more complete production of trading information and prices from Banca Intesa and *Bloomberg*. These event studies are summarized in Exhibits C-1, D-1 and H. I provide summaries of the event studies for two of the widely quoted and actively traded bonds in Exhibit C-1 for the 500 million in Euros Parmalat bonds offered in January 2001 with 6.0% Coupon and maturing February 6, 2006 (XS0123321068) and in Exhibit D-1 for the 650 million in Euros bonds offered in January 2000 with 6.25% Coupon and maturing February 7, 2005 (XS0106583577). Exhibit E demonstrates that the prices of the publicly traded Parmalat fixed income securities moved together in response to the corrective events in November and December 2003 consistent with an Informationally Efficient and Relatively Efficient market. Exhibit F demonstrates that one could not consistently exploit public

information about past stock and bond price movements to earn arbitrage profits trading Parmalat securities.

28. The events chosen in Exhibits C-1 and D-1 were the same as for the equity event study summarized in Exhibit B-1. The basic methodology was the same. I evaluated and considered a number of possible European bond indices as possible market indices, including the Citigroup Euro BIG 5 to 7 Year Index (SBEB57), Citigroup Euro BIG 3 to 5 Year Index (SBEB35), MSCI Credit Consumer Staples Index (ECCSTR), the MSCI Euro Debt 5 to 7 Year Index (MC57TR) and the Citicorp Euro BBB Index (SBEB3B). I also considered the stock indices previously considered in the equity event study and the abnormal returns from the equity event study.

29. Bond data is more difficult to deal with due to missing trade dates and the relatively low "true" effective price volatility as compared with the bid-ask spread and the fees and commissions within the bid-ask data and trade data. Additionally, much of the trade data obtained in discovery in this case reports prices net of fees and commissions. Since European fees and commissions can add up to 1% to 2% to the net purchase price for a bond and reduce the net selling price of the bond by a similar amount, the bid-ask data is often more relevant and reliable for modeling the price formation process.[39] Additionally, since "true" economic changes in bond prices on most days are minimal and less than the average bid-ask spreads, the daily trade data will often have too much noise relative to the fundamental movements. Using the Banca Intesa data with the *Bloomberg* bid-ask data to fill in missing prices, one can demonstrate affirmatively that the prices of Parmalat's debt securities are significantly influenced by

[39] Biais Study, p.p. 28-29, 31 and 34; *MiFID: FSA Discussion Paper on Best Execution Response from BMA/CMA/ISDA*, July 14, 2006, p. 28-29.

the movements of the European corporate bond indices and by company-specific news events.[40] I tested the *Bloomberg* mid-price (average of the bid and ask) and found it to match the Banca Intesa and bank trade data over time and to be more reliable in that the *Bloomberg* mid-price avoided the errors-in-variables problems present in the trade data. This is shown graphically in Exhibits C-2 and D-2. As shown in the bond event study exhibits, the relevant events in the November 14 to December 5, 2002; February 10 to March 28, 2003; and November 7 to December 19, 2003, time periods were collectively significant and generally consistent with expectations.

30. In Exhibit E, I provide a chart showing the price movements of a total of fifteen Parmalat fixed income securities over the last two months of 2003. The chart demonstrates that all of these securities generally moved in tandem over time and each security was affected in a similar manner by the relevant events in November and December 2003. Based on the analysis in Exhibit E, I constructed a Composite Parmalat Bond that represented the geometric average change in the quoted prices of those Parmalat bonds that reported prices on each trade day and the prior trade day. The Composite Index was then used to examine the common movements in Parmalat's bond prices.

31. In Exhibit F, I summarize a detailed analysis of the relationship between changes in fixed income prices over the current trade day as a function of abnormal equity returns on prior days and changes in the Composite Bond price on prior days. Due to the reporting issues, a two-day lag should be sufficient to avoid the bid-ask bounce and non-synchronous trading problems with the data and, yet, capture any systematic tendencies

[40] One method of controlling and reducing the trading noise relative to the fundamental movements is to examine the movements over longer return windows. I used a five-day forward looking regression to capture the correlation of weekly returns.

of Parmalat's fixed income securities to present arbitrage opportunities or to adjust slowly over time to significant prior events.[41] In performing this analysis, I excluded from current observations those dates when potentially material news was identified. I also examined the degree to which the current bond price change was a function of changes in the Composite Bond price two days prior or a function of the abnormal returns from Parmalat's common equity securities two days prior. The regression analyses consistently found that current changes in fixed income prices were correlated with and significantly affected by current changes in the Composite Bond price and by the contemporaneous abnormal return from Parmalat's common shares, but that past changes in the Composite Bond price and past abnormal returns from Parmalat's common shares were not significant in explaining current fixed income price movements. Thus, the markets for Parmalat's fixed income securities were generally Informationally Efficient and Relatively Efficient.

32. As a final check, I studied the effects of Parmalat events on the Composite Parmalat Bond prices constructed (based on the fixed income securities) in Exhibit F. The Composite Bond event study is summarized in Exhibit H. If the market for Parmalat's fixed income securities was inefficient, then the method of constructing the Composite Bond would result in a bond that has some evident inefficiency (a moving average process would result in significant serial correlation over two or more days). Instead, the Composite Bond has virtually no lead-lag relationships on a two-day basis (minimal negative first-order serial correlation) and is not correlated with prior abnormal equity returns (two day lag). The identified corrective events explain nearly all of the

[41] *See*, for example, Campbell, Lo and MacKinlay, *The Econometrics of Financial Markets*, 1997, pp. 99-103.

loss in the price of the Composite Bond over time and are extremely significant. Thus, the publicly traded bonds of Parmalat, as a group, reacted relatively rapidly to relevant information. This rapid reaction provides strong evidence for both Informational and Relative Efficiency.

33. Investors could not exploit past information to profit from movements in Parmalat's bond prices over time and observed no arbitrage opportunities. Given the significant reported trading volumes for Parmalat debt and preferred securities in Exhibit G, the quote and spread information in Exhibit I, and the event studies summarized in Exhibits C-1, D-1 and H, Parmalat's publicly traded fixed income securities were, therefore, traded in a Relatively Efficient market and investors generally relied on the prices quoted as reasonably reflecting the public information about Parmalat's credit risk.

VI. Comments on the Gompers Declaration

34. With respect to Professor Gompers' Declaration, I reviewed his assertions and conclusions and found the following:

(a) Professor Gompers' opinions are without context as to the level of market efficiency required in this case. The pricing of investment grade rated corporate bonds in Europe and the United States is often with respect to benchmark yields and credit risk.[42] In the absence of a major credit rating or risk event, bond price volatility for investment grade-rated securities (unless convertible into common equity with a reasonable prospect of conversion value being realized) is far less than for common shares. Thus, the need to constantly re-evaluate and trade bonds

[42] *Implications for Liquidity from Innovation and Transparency in the European Corporate Bond Market*, European Central Bank Occasional Paper Series No. 50, August 2006, p. 12; Response from the EFFAS – European Bond Commission to the Call for Evidence from the European Commission regarding Pre- and post-trade transparency provisions of the Markets in Financial Instruments Directive (MiFID)– September 15, 2006, pp. 17-18.

is not the same as for common stocks. Investors are often indifferent between two different debt securities by two different issuers, as long as they have equivalent credit ratings and similar durations and offer competitive yields.[43] With the development of an active CDS market, actual trades in Parmalat debt securities could not deviate too far from benchmark prices due to greater dealer competition (which is greater in Europe and for Parmalat debt securities than for equivalent US debt securities).[44] Thus, while reported indicative bid and ask prices for specific debt security may sometimes not appear to react as quickly to news, when active trading and interest was solicited by investors from dealers, the effective bid and ask spreads at which institutional investors could trade were quite small by US corporate bond standards and competition among dealers forced the pricing into relatively tight ranges due to Parmalat's known CDS spreads.[45] Similarly, with active pricing and quotes on the European market for Parmalat equity securities, the pricing of common shares could not deviate significantly from the market prices.

(b) Professor Gompers failed to mention evidence of market efficiency for the European bond market in the data available to him and in the studies he cites:

i. Professor Gompers ignores or fails to mention the important role of benchmark pricing and the development of the CDS market for Parmalat debt securities. His report only selectively considers and cites from the Biais Study

[43] Biais Study, p. 28; *MiFID: FSA Discussion Paper on Best Execution Response from BMA/CMA/ISDA*, July 14, 2006, p. 25.
[44] *Implications for Liquidity from Innovation and Transparency in the European Corporate Bond Market*, European Central Bank Occasional Paper Series No. 50, August 2006, p. 12; Biais Study, pp. 28, 35, and 37-38.
[45] Biais Study, pp. 29-30, 31, 35, 40-41, and 57-58; *MiFID: FSA Discussion Paper on Best Execution Response from BMA/CMA/ISDA*, July 14, 2006, p. 28-9.

on the European bond market. The Biais Study does not support Professor Gompers' ultimate conclusions. Furthermore, besides the Biais Study, other prior studies have recognized that the European securities market was becoming increasingly developed and efficient, was highly competitive among dealers and often resulted in lower bid-ask spreads than in the United States and greater market efficiency than in the United States.[46] Additionally, the Biais Study finds that the inability of most investors to "short" debt securities was overcome by the ability of dealers to effectively sell debt securities short or to effectively short those securities through CDS trades and the level of sophistication and nature of the dealers and larger investors in the market for Parmalat debt securities.[47]

ii. Professor Gompers is apparently unaware that dealer pricing information was transmitted into the retail market (especially in Italy). This developed retail market meant that retail investors assumed (and were generally correct in assuming) that the prices they were paying and receiving for buying and selling Parmalat debt securities were reflective of and based on market prices for securities that reflected the public information at the time.

iii. Professor Gompers fails to consider all of the trading information produced in discovery and does not report the substantial trading volume and turnover statistics for Parmalat debt securities provided in all the data.

[46] *The European Bond Markets under EMU* by Marco Pagano, Ernst-Ludwig von Thadden – November 2004; *European Fixed Income Markets: Money, Bond and Interest Rate Derivatives* by Batten, Fetherson and Szilagyi, 2004, p. 11.
[47] Biais Study, pp. 28 and 37-38.

iv. Professor Gompers' assertions regarding the *Bloomberg* bid and ask data for Parmalat debt securities are not correct.[48] For larger issuers and more actively traded debt securities, the *Bloomberg* quote data provides a reliable reference point for pricing debt securities, especially in Europe during the Class Period. The *Bloomberg* system was often relied upon in Europe for actual quotes and trades and provided benchmark guidance from which market participants priced debt securities. As shown in Exhibits C-2 and D-2 to this report and in Professor Gompers' own exhibits in Appendices A, B and C of his report, the *Bloomberg* price quotes were consistent with the average daily prices from the ICMA and bank trade data and were generally more reliable and more consistent with more detailed trade data than the ICMA quote and trade data relied on by Professor Gompers. The ICMA and bank trade data contain inconsistencies in reporting (due to timing and the inclusion of commissions and fees), and the average bid-ask spreads in the ICMA data are generally overstated relative to the true, effective spreads actually observed in practice by entities trading those securities.[49] When one controls for fees and commissions affecting the prices reported in the ICMA data and the scale of the charts in Professor Gompers' Appendices A, B and C, then the ICMA data suggests that the average price of Parmalat debt securities is within a relatively tight trading range during periods when there are few changes in market interest rates or information that might alter Parmalat's perceived credit risk.

[48] Biais Study, pp. 29-30, 35 and 38. *See also European Bond Pricing Sources and Services: Implications for Price Transparency in the European Bond Market* – April 2005, pp. 2 and 7.
[49] Biais Study, pp. 57-58.

v. Finally, with respect to many of the apparent pricing discrepancies asserted by Professor Gompers, these discrepancies often were mostly the function of inconsistent reporting (the result of brokerage commissions and fees being included in the reported trade prices, making the data less comparable across sources and within a source when multiple reporting entities provide the data), the timing of reporting (where some trades may be negotiated but not reported until after a delay of one day or more), and "stale" bid and ask quotes from some dealers being included in the averages he cites. Therefore, the effective bid-ask spreads for Parmalat's debt securities were much smaller than indicated by Professor Gompers. Furthermore, these pricing discrepancies are actually quite small by bond trading standards and do not fundamentally alter the conclusion of relative market efficiency. Thus, Professor Gompers' cited "evidence" for inefficiency is anecdotal, incomplete or immaterial relative to the allegations and the materiality of the fraud alleged in this case.

(c) Professor Gompers does not perform a rigorous event analysis in reaching his conclusions. As I discussed previously, when information was significant and particularly relevant to the pricing of Parmalat's debt securities, the prices of Parmalat's debt securities reacted rapidly and consistent with the provided information as shown in Exhibits C-1, D-1 and H.

Worldwide Market

35. Professor Gompers attempts to suggest that the market for Parmalat's securities was not global. But his discussion merely suggests that debt securities and equity securities are somehow trading in separate markets. This misconstrues the concept of a

global market. The worldwide market means that investors were increasingly diversifying their investments such that, prior to and during the Class Period, the European securities markets became increasingly linked with and competitive with the other developed securities markets in North America and in Japan.[50] Thus, throughout the Class Period, the movements of security prices in different geographical markets were correlated globally and the degree of correlation has increased over time.[51] Parmalat was a multinational company, with debt offerings in multiple markets and currencies, such that its securities were actively followed and traded in international markets by investors from all continents.

36. Additionally, the idea of a conflict between bondholders and equity holders is overstated. While common equity securities and fixed income securities have a number of different characteristics, they are not entirely separate or segmented from each other such that common equity and fixed income securities issued by a common issuer tends to be correlated over time. The contemporaneous correlation of Parmalat's fixed income securities prices and its common share price was extremely significant in this case. In most instances, events that adversely affect debt holders also have adverse effects on equity holders, especially in the context of the issues and claims in this particular case. Issues of leverage, interest coverage, and default risk influence both the required rate of return on debt securities and the required rate of return on equity securities in the same direction.

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[50] The European Bond Market Study, December 2004, pp. 5-7 and 10; *The European Bond Markets under EMU* by Marco Pagano, Ernst-Ludwig von Thadden – November 2004.

[51] *Global Financial Stability Report: Market Developments and Issues by International Monetary Fund*, September 2002, September 2003 and September 2004 issues, particularly, Sep 2003 at pp. 67-68 and Sep. 2004 at p. 22. *See, also, The European Bond Markets under EMU* by Marco Pagano, Ernst-Ludwig von Thadden – November 2004, p. 20.

False Assertions Regarding the Market Efficiency of Parmalat Bonds including Bid-Ask Spreads

37. Professor Gompers asserts that the bond market in Europe "was illiquid and opaque" or lacks transparency. However, this is not true for the fixed income securities of issuers such as Parmalat. Professor Gompers similarly suggests that the fact that Parmalat's bonds traded primarily in an over-the-counter, dealer market means that the pricing of bonds is less transparent than for stocks. In actuality, a competitive dealer market is often highly efficient and can result in very reliable pricing, especially when interacting primarily with institutional investors.[52] Furthermore, Professor Gompers fails to note that Parmalat bonds traded in the European market were more actively traded and had greater dealer competition than equivalently sized issues in the United States during the Class Period.

38. Professor Gompers ignores and misquotes the conclusions and implications of the Biais Study he cites in footnotes 7 and 11 of his declaration and appears to rely upon for his conclusions. This study found that, by 2003, there were considerably more dealers, lower effective bid-ask spreads and greater trading volume and turnover for the debt securities of larger issues and issuers such as Parmalat in Europe than in London or in the United States.[53] Furthermore, the study concluded that the European corporate debt securities market was more liquid (higher trading volume and turnover, lower effective bid-ask spreads) than the United States and London corporate debt markets in 2003,

[52] Biais Study, pp. 29-30. Also, *Implications for Liquidity from Innovation and Transparency in the European Corporate Bond Market*, European Central Bank Occasional Paper Series No. 50, August 2006, pp. 12 and 20.

[53] Biais Study, pp. 35, 40-41, 53 and 57-58; *Implications for Liquidity from Innovation and Transparency in the European Corporate Bond Market*, European Central Bank Occasional Paper Series No. 50, August 2006; *The European Bond Markets under EMU* by Marco Pagano, Ernst-Ludwig von Thadden – November 2004; The International Role of the Euro: Evidence from Bonds Issued By Non-Euro Area Residents, Occasional Paper Series No. 18, July 2004, p. 7.

despite greater post-trade transparency in the United States beginning in June 2002.[54] The European markets have greater effective pre-trade transparency in electronic systems and methods of obtaining dealer quotes and greater competition among dealers for trades in bonds issued by larger issuers and larger issues such as those of Parmalat in this case.[55]

39. Notwithstanding Professor Gompers' emphasis on the problems with non-binding quotes, the Biais Study finds that the quotes provided by dealers in Europe are consistent with actual trading prices, are reliable, and are relied upon in price setting.[56] As the information provided in Exhibits C-2 and D-2 to this report demonstrates, the bid-ask quotes on *Bloomberg* are very close to and track very well the actual trading prices of the identified Parmalat securities. Additionally, the bid-ask spreads quoted on *Bloomberg* are greater than (set the outer bound) the effective spreads realized in actual trades by institutional investors and are superior to the ICMA data relied upon by Professor Gompers (which is less reliable for certain of the Parmalat securities in this case).[57]

40. Professor Gompers never tests the bid-ask quote information against the reported trading prices and the average trading prices in the data. Had he performed such analyses, he would have found (consistently with the charts in Appendices A, B and C of his declaration) that the quote data was an excellent measure of the current market price over time. I am familiar with working with bond trade data. For larger issuers such as Parmalat, the delay in quotes and price reactions to material news is minimal when information affecting Parmalat's credit risk was significant. Additionally, as was

[54] Biais Study, pp. 35, 40-41, 53, 57-58, and 64.
[55] *European Bond Pricing Sources and Services: Implications for Price Transparency in the European Bond Market*, European Primary Dealers Associations, April 2005, p. 2 and 7; Biais Study, pp. 29-30. 31, 34-35, 37-38, 41, 47, 53, 58, and 64; *MiFID: FSA Discussion Paper on Best Execution Response from BMA/CMA/ISDA*, July 14, 2006, p. 28-9.
[56] Biais Study, p. 57, finds lower effective spreads and reliance on *Bloomberg* quotes (p. 29-30).
[57] Ibid.

previously discussed, the fundamental bond price volatility is very small such that the bid-ask spreads and commissions and fees tend to dominate the apparent movements in daily bond prices. This "bid-ask spread bounce" is natural and normal. When one controls for the volatility created by the bid-ask spread and fees and commissions in the price data using a moving average filtering process, then it becomes apparent that Parmalat's bond prices were efficiently determined. My event studies on Parmalat bond data find that Parmalat bonds reacted rapidly and efficiently to news that would reasonably be expected to affect bond pricing.

41. Notwithstanding Professor Gompers' assertions that Parmalat's bonds were illiquid, as previously discussed, I found no evidence of difficulties in finding dealers willing to buy and sell Parmalat bonds during the Class Period and plenty of indicia (in quoted bid-ask spreads and trading volumes) that Parmalat bonds were not difficult to trade, especially given the features of the European bond market and, specifically, the Italian bond market which allows for retail purchase of Italian bonds through Italian banks.

42. Finally, Professor Gompers' comments regarding the inability to short bonds are both wrong and naïve. He misquoted the Biais Study and ignored the important role of CDS spreads and quoted spreads to benchmark rates to price different securities of a single issuer.[58] Furthermore, Professor Gompers completely underestimated the important role of dealers as arbitragers in corporate bond markets in both the United States and Europe. European dealer competition was considerably greater than US

[58] Biais Study, pp. 37-38; *Implications for Liquidity from Innovation and Transparency in the European Corporate Bond Market*, European Central Bank Occasional Paper Series No. 50, August 2006, pp. 20-21; *Response from the EFFAS – European Bond Commission to the Call for Evidence from the European Commission regarding Pre- and post-trade transparency provisions of the Markets in Financial Instruments Directive (MiFID)*– September 15, 2006, pp. 17-18.

competition to deal in larger issues and/or bonds by larger issuers such as Parmalat. Dealers can, and often do, short corporate debt securities. Additionally, the development and quotation of CDS spreads for a benchmark five-year Parmalat CDS meant that dealers could actively and effectively short Parmalat debt securities. Because bond pricing is considerably more precise and certain for a known amount of credit risk for a given security, the availability of CDS spread quotes and spreads to benchmark rates meant that Parmalat bonds could be readily priced based on the issuer and duration against appropriate benchmark securities.

43. In summary, the impression given by Professor Gompers' discussion on pages five to nine of his declaration reflects the European corporate bond market as it might have existed in the 1980s and early 1990s and completely misrepresents the growing development, integration and efficiency of the European corporate bond market which occurred in the late 1990s leading up to the adoption of a common Euro currency and in the period between 2000 and 2003. While his discussion might still be applicable to smaller bond issuances by unrated or relatively small European issuers and where such bonds trade infrequently and are not regularly quoted by dealers, his discussion is not applicable to larger security issues and issuers, such as Parmalat, which provide substantial daily and monthly average trading volumes and provide consistently quoted securities (Exhibit I). Individual Parmalat bonds could be and were priced based on quoted spreads to benchmark bonds during the Class Period. No security market is perfectly efficient or ideal. Thus, the relevant question is the level of development and efficiency in the European corporate bond market and, particularly, the market for Parmalat debt securities. The information provided to me is quite extensive and suggests,

even after reviewing Professor Gompers' analyses in detail, that Parmalat's debt securities were more actively quoted and traded than the debt securities of some of the largest issuers in the United States.

Specific Evidence on Trading

44. Professor Gompers asserts that "Parmalat Bonds Traded Inefficiently Within the Eurobond Market" (Gompers Declaration, pp. 10-13). His conclusions are not supported by the published literature or a proper analysis of the underlying quote and trading data. The ICMA data considered by Professor Gompers is incomplete compared with the other trading information, such as data obtained from the Banca Intesa production. Nevertheless, the aggregate volumes of trading in Parmalat bonds reported in the ICMA data relied upon by Professor Gompers were quite robust by US bond trading standards. The trading volumes and turnover rates for a number of Parmalat fixed income securities is shown in Exhibit G to this report. Since significant trading in Parmalat debt securities occurred at the retail level, Professor Gompers misses much of the trading. Additionally, where fairly complete trading information on certain Parmalat securities was available from the Banca Intesa production, Professor Gompers apparently ignored that data.

45. Some of Professor Gompers' comments and analyses of the data suggest a lack of experience or knowledge of working with bond trading data. Professor Gompers emphasizes that Parmalat's bonds often did not trade on exchanges. But bonds generally do not trade on exchanges and, yet, can be actively quoted, frequently traded and efficiently priced. As previously discussed, by US bond trading standards, the findings in Professor Gompers' Exhibit 3 that individual Parmalat bonds traded often and that Parmalat bonds on average traded on 55% of the potential trade days is excellent

considering this finding was based on data that excludes most retail trade information and is derived from a limited and incomplete sample of banks and from ICMA. Filling in additional information from retail trades or clearing data would have suggested that Parmalat's fixed income securities trade on most days and are, therefore, considered actively traded.

46. Professor Gompers also focuses on the quoted bid-ask spreads. However, the ICMA data considered by Professor Gompers, by its nature, tends to vastly overstate the actual bid-ask spreads in practice. This is because the ICMA data essentially provided the average spread between the bid and ask prices of each dealer as opposed to the spread between the best bid price and the best ask price that would typically be offered by dealers. Thus, the effective spreads for securities in the European bond markets are not consistent with the ICMA data. Additionally, the inclusion of fees and commissions in European reporting systems and inconsistencies between reporting entities and produced trading records means that the comparability of trading prices across the data sources is limited. Professor Gompers' footnote 28 on page 11 is at least an admission that maybe there are limitations with the quote data. As shown in Exhibits C-2 and D-2 to this report, the *Bloomberg* bid and ask quotes tended to closely match average reported trading prices for the larger issues of Parmalat. Similarly, the Biais Study found that the *Bloomberg* quotes and other dealer quotes were reliable and relied upon in the European bond market and that the effective spreads were less than the quoted average spreads.[59]

47. Professor Gompers (Gompers Declaration, p. 12 and Exhibit 5) only finds one situation where a privately placed bond is compared with a publicly traded bond and their reported trade prices appear to differ for a few trades of the privately placed bond in

[59] Biais Study, pp. 29-30, 31, 34-35, 37-38, 41, 47, 53, 58, and 64.

March 2003. Of course, this ignores that he is considering a privately placed bond in this analysis and that the prices appear to converge when relevant news arises at the end of the Class Period. As shown in Exhibit E and Exhibit H, Parmalat's publicly traded fixed income securities generally moved in tandem over time in response to relevant news.

48. Professor Gompers also asserts that the returns of Parmalat's bonds were predictable and that this suggests inefficiency (Gompers Declaration, pp. 12-13 and Exhibit 6). However, when properly considered and constructed, the bond trading information does not support Professor Gompers' assertions that an exploitable arbitrage opportunity exists with respect to the trading of Parmalat bonds. The lead-lag analysis provided in Exhibit 6 to Professor Gompers' report is essentially data mining and is a well known issue in the market efficiency literature.[60] Non-synchronous trading can produce spurious (false) apparent cross-correlation, lead-lag relationships, especially if the effects of events are not properly considered or controlled for in the data. Similarly, the inclusion of commissions and fees in the quoted prices (increasing the apparent differences between purchase and selling prices in the ICMA and bank data considered) can lead to substantial noise in the data. If there really was exploitable lead-lag and serial correlation consistent with an inefficient market, then the results in Exhibit 6 should follow a predictable pattern across the various securities. There is no apparent or obvious pattern one can find from the data in Exhibit 6. The data in Exhibit 6 complies with the old maxim that "If one tortures the data enough, it will confess." If one examines enough trade data over a longer period of time and fails to control for the effects of the bid-ask spread and non-synchronous trading in individual securities, then it is possible to often

[60] *See*, for example, Campbell, Lo and MacKinaly, *The Econometrics of Financial Markets*, 1997, pp. 20-24 and pp. 84-144.

find small, but economically insignificant, "false" apparent lead-lag and serial correlation relationships in security pricing data, especially in bond pricing data.

49. The tests provided in Exhibit 6 are further biased and misspecified because they do not control for known material events and the timing of trades. It is well-known that event-driven security prices can appear in retrospect to have drift and serial correlation even when *a priori* tests demonstrate no such obvious predictable tendencies. Finally, when bond trading does not occur every day, then the effect of missing data and the timing of trades across securities can introduce small, apparent, but economically insignificant, correlations over time especially with respect to equity returns leading bond returns. Professor Gompers does not inform us as to how he controlled for the effects of missing trade dates, when unobserved changes in prices cannot be identified on days with missing trades or delayed reporting of trades.

50. In Exhibit F to this report, I corrected for the flaws in Professor Gompers' analysis and the problems with non-synchronous trading and bid-ask bounce issues by examining the two day lag relationships between various Parmalat securities after controlling for other factors and known events. This analysis finds no material or exploitable relationship. Indeed, the average relationship between the movements in Parmalat's bond prices and past movements in Parmalat's bond and share prices is close to zero. If Parmalat's security returns were predictable, then the two-day lag relationship should have shown a tendency toward a specific direction of relationship and the individual lead-lag regressions and the joint (group) test for significance should have found a significant relationship. As shown in Exhibit F, on average, the group

relationship between current bond returns and past common stock and Parmalat bond returns is approximately zero.

51. When examining serial correlation and lead-lag regressions one has to use some common sense. If the first order correlation is very small and the coefficient is very small, then it is not exploitable in reality and the market is considered Relatively Efficient. For example, suppose that the average standard error for a bond is 0.2% on a non-event day and the effective bid-ask spreads for the most efficiently traded and highly liquid bonds range from 0.05% to 0.2%. Now suppose that the lead-lag coefficient between two securities is 0.10 in each direction, which is substantially greater than most of the "significant" coefficients identified in Exhibit 6. Then one could predict that an apparent 0.2% increase in one bond's price one day might lead to a 0.02% increase in the bond price of the other bond on average the following day. Since 0.02% is less than the lowest bid-ask spread in the most liquid bond markets, it is not exploitable and not material to investors. No investor would waste his timing trading for an extra 0.02% gross return per day after subtracting a round-trip cost of 0.05% to 0.2% and considering the economic cost of time and resources dedicated to such a strategy.

52. The bid-ask spread in dealer and market maker data can often induce small false apparent negative correlations. For example, suppose a common stock is trading over a series of days with no changes in fundamental information and no real price changes. A closing purchase at the bid (low price) one day after a closing price the price day at the asking (high price) will mistakenly lead to a "false" estimate of a negative return. The next day half the time will be followed by a closing price at the bid price, which produces no change, and half the time will be followed by a closing price at the ask, which

produces a "false" positive return. In this hypothetical scenario, a negative return will always be followed by either no change or a positive return and, similarly, a positive return will always be followed by either no change or a negative return. This will always produce a statistically significant negative serial correlation coefficient. But that serial correlation is neither real, nor exploitable and, therefore, is not considered evidence of an inefficient market.

53. As for the bond pricing data in Professor Gompers' Appendices, rather than suggesting an inefficient market, they suggest that the pricing tends to move consistently across data sources and over time when the most material events occurred. As I examined the ICMA and *Bloomberg* bid and ask quote comparisons, one can visually see that they are moving together through time and that the purported discrepancies are very small relative to the significant relevant events in this case. The dips in bond prices in February and March 2003 are readily observable as are the rapid downward movements in November and December 2003. Furthermore, the differences between *Bloomberg* and ICMA quotes are exaggerated by the scaling of the data in the charts in Professor Gompers' charts.

54. The Appendix B and C data in Professor Gompers' report is similarly not troubling. When one understands the limitations of European trade data (which typically includes the effects of commissions and fees and which may be delayed in reporting) and the amount of intraday bond pricing movements that occurred in the reported news between December 8 and 30, 2003, then the purported pricing differences are not material and cannot be relied upon to reach any conclusions regarding market efficiency.

Bank trade data often has some apparent outliers even in the most efficient markets due to a variety reasons.

55. Professor Gompers takes issue with the use of *Bloomberg* bid and ask data to demonstrate efficiency (Gompers Declaration, pp. 13-16). He is wrong. I spoke at length with *Bloomberg* professionals regarding this data and its reliability with respect to European fixed income securities and the use of the CDS data to price bonds as well. I also tested the *Bloomberg* quote data against average trade prices and based on the event study. The *Bloomberg* quote data is an excellent proxy for the true price of Parmalat bonds over time.

56. The pricing differences between the *Bloomberg* quotes and the trade data considered by Professor Gompers is a function of trading prices being provided net of fees and commissions, which Professor Gompers fails to either realize or disclose. The supposed inconsistent price movements in the quote data Professor Gompers notes are minimal overall and largely due to inconsistent reporting of quotes on days with no trades. Additionally, the supposedly inconsistent daily movements in quoted prices Professor Gompers notes were found when the underlying bond prices were hardly changing over time and were, therefore, immaterial to investors. As explained earlier, Parmalat's bonds were priced based on benchmark bonds and credit spreads. Thus, investors and dealers always had good information on Parmalat's bonds. Thus, to a large extent, Professor Gompers' discussion is immaterial and fails to consider the nature of the data. When properly considered, Exhibits C, D and H illustrate that Parmalat's fixed income securities traded consistently in response to relevant news events over time.

Private Placements

57. The quote and secondary trade information on Parmalat's privately placed fixed income securities was more limited in nature. However, the ability of investors to price privately placed securities was based on the existence of actively traded public fixed income securities and quoted CDS information. As a result, the more limited trading in privately placed securities was still priced relatively efficiently leading to an increase in issuances of foreign Rule 144A offerings over the past fifteen years.[61]

Common Equity Shares

58. The discussion by Professor Gompers on the US grey market is misguided. The purported "grey market" trades are typically just orders by US retail (and occasionally institutional) investors for Parmalat common shares that were ultimately executed in Europe in Euros (after adjusting for exchange rates). Professor Gompers appears to be surprised by this. Sometimes, US brokers will report those trades to the NASD out of caution, even though the trades were actually made in Europe. Thus, Professor Gompers' apparent issue with the overlap of NASD trades with reported trades in Milan is a false issue. Anyone familiar with this data would have expected such a finding. Similarly, the NASD reported trades are often reported with a delay and may not appear to "exactly" match the prices in Milan.

59. As long as the trade is "not solicited," one can easily trade foreign registered securities by either setting up a foreign brokerage account or by using a US broker to trade through a foreign broker on a foreign exchange.[62] The commissions and fees for US

[61] *Building a Transatlantic Securities Market, International Securities Market Association*, 2002, by Benn Steil, pp. 58-49.

[62] *Building a Transatlantic Securities Market, International Securities Market Association*, 2002, by Benn Steil, pp. 28-29 and 45 ("SEC notes a 4,700% increase in the trading of foreign securities by US residents in the fifteen years to 1995;" "Commission further notes the role of 'advanced technology' in facilitating such trading, as evidenced by the ability of US investors to trade directly on overseas exchange trading systems via so-called 'pass-through' electronic linkages provided by both US and foreign broker-dealers

resident individuals and entities will tend to be greater for trading securities not registered in the US but are not prohibitive in reality.[63] That Parmalat shares were occasionally reported as traded to the NASD in the US is evidence that US retail investors could and did, in fact, often purchase such securities. It is also evidence that there were hundreds of such US retail investors over time.

60. Similarly, Professor Gompers' mention of the lack of bid and ask quotes and trade data for Parmalat's common shares on the NASD is a non-issue. Anyone with a computer, brokerage account, or access to a *Bloomberg* terminal would look at the quoted prices and trade data on the European market to price a Parmalat common share. As previously discussed, the European market for Parmalat's common shares is highly efficient.

61. The whole discussion about the apparent "lack of integration" of the NASD trades in after-hours with the Milan market reflects a lack of understanding. No one would rely on the NASD prices because they are simply reflective of US orders for a European security. Similarly, one would rely on European analyst reports when considering purchasing a European security. While after-market trades may deviate a small amount from quoted prices during normal exchange hours, this difference is merely the effect of commissions and fees being incorporated in the prices implicitly or explicitly or the timing of the reporting of the trades. The prices reported in the NASD data were determined by the common share prices during exchange hours in Milan. The fact that the NASD prices appeared to mirror prices in Milan during normal trading hours in Milan should have indicated to Professor Gompers that the markets were integrated because

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and other access providers.")

[63] Ibid., pp. 28-29.

they were really a single market for Parmalat shares based on quoted prices in Europe. Any apparent "discrepancies" were the result of the peculiarities of US brokers reporting orders and trades (often with a delay) on a European registered security to the NASD.

VII. Discussion of the Comment Declaration

62. The fact that Dr. Comment finds that US institutional investors reported significant and material holdings of Parmalat common shares suggests that the market for Parmalat shares was efficient and global. These institutions included mutual funds with a focus on global or international investors.

63. The Comment Declaration is generally correct in concluding that most US-affiliated investors in Parmalat securities are typically accredited investors (QIBs). However, his report overstates the barriers to direct trading in foreign securities not registered for trading in the United States.[64] US residents can, and often do, purchase on a retail basis foreign securities either directly through a foreign broker or through a US broker that acts as an intermediary to a foreign broker as long as the trades are on an "unsolicited" basis. This typically increases the commissions and fees associated with retail trades, but has little other effect on the ability to trade in foreign registered securities. Thus, Dr. Comment's suggestion that US holdings of Parmalat securities are limited to the identified institutional investors in his report is in error. Due to unreported holdings and non-institutional purchasers, the US government data sources will typically apply a "gross-up" factor to account for the additional shares of foreign securities held by US entities not captured in the reported government data.[65] The existence of reported

[64] *Building a Transatlantic Securities Market, International Securities Market Association*, 2002, by Benn Steil, pp. 28-29 and 45.

[65] *See Report on U.S. Portfolio Holdings of Foreign Securities as of December 31, 2003,* March 2005 report, pp. 21-22. *See also, Report on Foreign Portfolio Holdings of US Securities as of June 30, 2003,*

"grey market" trades on the NASD is further evidence of significant retail shareholders in the US. Thus, given the reported institutional holdings of Parmalat securities and the grey market trades, the unreported holdings of Parmalat equity and fixed income securities by US residents were material and represented a substantial number of US investors that purchased Parmalat securities.

August 2004 Report. The "gross up" factor for non-governmental issues of foreign long-term debt was 1.1591 on average in 2001 and 1.12542 in 2003, implying that actual holdings are estimated to be 15.9% greater than reported at the end of 2001 and 12.5% greater than reported at the end of 2003. The similar gross up factors for foreign equity securities was 1.04679 in 2001 and 1.04596 in 2003. The foreign equity gross up factor is likely understated for Parmalat common shares due to the fact that ADR and ADS holdings are reported with greater reliability than non-ADS and non-ADR holdings.

I declare under penalty of perjury under the laws of the State of Texas and the United States that the foregoing is true and correct. If called as a witness I could and would competently testify thereto.

Executed this 15th day of December 2006 at Dallas, Texas.

Scott D. Hakala, Ph.D., CFA